



Complete Summary

GUIDELINE TITLE

Practice advisory on liposuction.

BIBLIOGRAPHIC SOURCE(S)

Iverson RE, Lynch DJ. Practice advisory on liposuction. Plast Reconstr Surg 2004 Apr 15; 113(5):1478-90. [59 references] [PubMed](#)

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE

METHODOLOGY - including Rating Scheme and Cost Analysis

RECOMMENDATIONS

EVIDENCE SUPPORTING THE RECOMMENDATIONS

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

CONTRAINDICATIONS

QUALIFYING STATEMENTS

IMPLEMENTATION OF THE GUIDELINE

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT

CATEGORIES

IDENTIFYING INFORMATION AND AVAILABILITY

DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

- Body contour irregularities due to localized fat deposits (localized adiposity)
- Obesity, gynecomastia, and breast hypertrophy

GUIDELINE CATEGORY

Management

CLINICAL SPECIALTY

Anesthesiology
Plastic Surgery
Surgery

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To define the principles of practice for patients undergoing liposuction

TARGET POPULATION

Patients undergoing liposuction surgery

INTERVENTIONS AND PRACTICES CONSIDERED

Liposuction Techniques

1. Suction-assisted lipoplasty
2. Dry technique (not recommended except in limited applications)
3. Wet technique
4. Superwet technique
5. Tumescent technique
6. Ultrasound assisted liposuction
7. Power assisted liposuction
8. Cannula selection

Patient Management

1. Patient selection
2. Determination of appropriate liposuction volume
3. Fluid management (monitoring of fluid intake and output, communication with anesthesia care provider, hemoglobin measurements, calculation of residual fluid volumes after liposuction)
4. Multiple procedure management
5. Intraoperative care
6. Postoperative care
7. Patient follow up

Anesthesia

1. Anesthetic infiltrate solutions
 - Marcaine (bupivacaine) (caution urged due to severity of side effects)
 - Lidocaine
 - Epinephrine
2. Epidural anesthesia
 - Chloroprocaine
3. General anesthesia
4. Moderate sedation/analgesia
5. Use of American Society of Anesthesiologists' Guidelines for Sedation and Analgesia

MAJOR OUTCOMES CONSIDERED

Morbidity and mortality associated with liposuction and anesthesia

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

At the 69th annual meeting of the American Society of Plastic Surgeons (ASPS) in October of 2000, the ASPS Board of Directors convened the Task Force on Patient Safety in Office-Based Surgery Facilities. The task force was assembled in the wake of several highly publicized patient deaths involving plastic surgery and increasing state legislative and regulatory activity of office-based surgery facilities. In response to the increased scrutiny of the office-based surgery setting, the task force produced two practice advisories: "Procedures in the Office-Based Surgery Setting" and "Patient Selection in the Office-Based Surgery Setting." Since the task force's inception, professional and public awareness of patient

safety issues has continued to grow. This heightened interest resulted in an increased need for plastic surgeons to communicate their views on the topic. To meet this challenge, the task force evolved into the Committee on Patient Safety, allowing the committee to address topics affecting the safety and welfare of plastic surgery patients, regardless of the facility setting.

The "Practice Advisory on Liposuction" is the first advisory developed since the committee was formed. It was a lengthy and painstaking process for the committee, which included representatives from related plastic surgery organizations as well as the American Society of Anesthesiologists (ASA).

This advisory is based on the best information available and largely reflects the collective opinion of the members of the American Society of Plastic Surgeons (ASPS) Committee on Patient Safety. This advisory provides a synthesis and analysis of expert opinion, clinical feasibility data, open forum commentary, and consensus surveys.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guideline was approved by the American Society of Plastic Surgeons Board of Directors on March 15, 2003.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Liposuction Techniques

1. Due to the amount of blood loss associated with the dry technique, its use is not recommended except in limited applications with a volume of 100 cubic centimeters (cc) total aspirate or less.
2. The dry technique should never be used in conjunction with ultrasound-assisted liposuction.
3. No one single liposuction technique is best suited for all patients in all circumstances. Factors such as the patient's overall health, the patient's body mass index, the estimated volume of aspirate to be removed, the number of sites to be addressed, and any other concomitant procedures to be performed

should be considered by the surgeon to determine the best technique for the individual patient.

Liposuction Cannulas

1. No one cannula is best suited for all patients in all circumstances. Factors such as the patient's overall health, the volume of aspirate to be removed, the areas of the body to be treated, the number of sites to be addressed, the technique chosen (suction-assisted, power-assisted, or ultrasound-assisted liposuction), and physician preference determine the cannula best suited for the individual patient.

Anesthesia

Anesthetic Infiltration Solutions

1. In small-volume liposuction, infiltrate solutions containing local anesthetic agents may be sufficient to provide adequate pain relief without the need for additional anesthesia measures. The patient or the surgeon may prefer the use of sedation or general anesthesia even with small volumes of liposuction.
2. Marcaine (bupivacaine) should be used cautiously as an additive in infiltrate solutions due to the severity of side effects, slow elimination, and inability to reverse potential toxicity.
3. Lidocaine administered in wetting solutions to large or multiple regions of the body has the potential to cause systemic toxicity. Preventive measures include the following:
 - Limit the lidocaine dose to safe levels of 35 mg/kg. This level may not be safe in patients with low protein levels and other medical conditions where the metabolic byproducts of lidocaine breakdown may reach problematic levels.
 - Calculate the dose for total body weight.
 - Reduce the concentration of lidocaine when necessary.
 - Utilize the superwet rather than the tumescent technique.
 - Consider not using lidocaine when general or regional anesthesia is utilized.
4. Epinephrine use should be avoided in patients who present with pheochromocytoma, hyperthyroidism, severe hypertension, cardiac disease, or peripheral vascular disease. In addition, cardiac arrhythmias can occur in predisposed individuals or when epinephrine is used with halothane anesthesia. The surgeon must carefully evaluate these types of patients before performing liposuction.
5. Consider staging the infiltration of multiple anatomic sites to reduce the possibility of an excess epinephrine effect.

General Anesthesia, Epidural Anesthesia, and Moderate Sedation/Analgesia

1. Plastic surgeons should utilize the American Society of Anesthesiologists' (ASA) Guidelines for Sedation and Analgesia (ASA, 2002).
2. General anesthesia can be used safely in the office setting.

3. General anesthesia has advantages for more complex liposuction procedures that include precise dosing, controlled patient movement, and airway management.
4. Epidural and spinal anesthesia in the office setting is discouraged because of the possibility of vasodilation, hypotension, and fluid overload.
5. Moderate sedation/analgesia augments the patient's comfort level and is an effective adjunct to anesthetic infiltrate solutions.

Patient Selection

1. Even though liposuction is generally an elective procedure, the liposuction patient must be assessed using the same standards as those used for anyone who is undergoing any type of surgery, including a complete preoperative history and physical examination.
2. In some cases, liposuction may be used in the treatment of gynecomastia, breast hypertrophy, and obesity.
3. The body mass index is a good method to assess the liposuction patient's relative risk/benefit for the procedure (see Table II in the original guideline document)
4. In obese patients receiving large-volume liposuction, it may be necessary to modify the anesthetic infiltrate solution to prevent lidocaine toxicity.
5. Not all patients are appropriate liposuction candidates. These patients may wish to continue diet and exercise routines, seek medical intervention to treat an existing condition(s), consider bariatric evaluation, or, in the case of patients who have unrealistic expectations about their condition or potential outcomes, be referred for a psychiatric or psychological evaluation.

Liposuction Volume

1. Regardless of the anesthetic route, large volume liposuction (greater than 5,000 cc of total aspirate) should be performed in an acute-care hospital or in a facility that is either accredited or licensed. Postoperative vital signs and urinary output should be monitored overnight in an appropriate facility by qualified and competent staff who are familiar with perioperative care of the liposuction patient.
2. Under certain circumstances, it may be in the best interest of the patient to perform large-volume procedures as separate serial procedures and to avoid combining them with additional procedures.

Fluid Management

1. A data sheet should be used to facilitate communication.
2. The intake and output of all fluids utilized in the operative and postoperative periods should be accurately monitored.
3. Communication with the anesthesia care provider about fluid management is critical.
4. Fluid management and liposuction surgery must account for maintenance requirements, preexisting deficits, and intraoperative losses of aspirated tissue and third-space deficits.
5. Preexisting fluid deficits should be minimal after an overnight fast.
6. Blood loss estimates should be made and confirmed with preoperative and postoperative hemoglobin measurements. However, due to fluid shifts,

- hemoglobin levels may not be reliable during the first 24 hours postoperatively.
7. Calculation of residual fluid volumes after liposuction is helpful in planning postoperative care.

Multiple Procedures

1. Large-volume liposuction combined with certain other procedures has resulted in serious complications, and such combinations should be avoided (Iverson, 2002).
2. Individual patient circumstances may warrant performing liposuction as a separate procedure (Iverson, 2002).

Please see the original guideline document for recommendations on training and qualifications for physicians performing liposuction.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not specifically stated.

This advisory is based on the best information available and largely reflects the collective opinion of the members of the American Society of Plastic Surgeons (ASPS) Committee on Patient Safety. This advisory provides a synthesis and analysis of expert opinion, clinical feasibility data, open forum commentary, and consensus surveys.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- The performance of liposuction with minimal risks of morbidity and no mortality
- When performed by a surgeon with knowledge of the physiologic implications of this surgery, surgery, liposuction can be a safe procedure that results in significant patient satisfaction.

POTENTIAL HARMS

Not stated

CONTRAINDICATIONS

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Epinephrine use should be avoided in patients who present with pheochromocytoma, hyperthyroidism, severe hypertension, cardiac disease, or peripheral vascular disease. In addition, cardiac arrhythmias can occur in predisposed individuals or when epinephrine is used with halothane anesthesia. The surgeon must carefully evaluate these types of patients before performing liposuction.

QUALIFYING STATEMENTS

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- Practice advisories are strategies for patient management, developed to assist physicians in clinical decision making. This practice advisory, based on a thorough evaluation of the present scientific literature and relevant clinical experience, describes a range of generally acceptable approaches to diagnosis, management, or prevention of specific diseases or conditions. This practice advisory attempts to define principles of practice that should generally meet the needs of most patients in most circumstances. However, this practice advisory should not be construed as a rule, nor should it be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonably directed at obtaining the appropriate results. It is anticipated that it will be necessary to approach some patients' needs in different ways. The ultimate judgment regarding the care of a particular patient must be made by the physician in light of all the circumstances presented by the patient, the diagnostic and treatment options available, and the available resources.
- This practice advisory is not intended to define or serve as the standard of medical care. Standards of medical care are determined on the basis of all the facts or circumstances involved in an individual case and are subject to change as scientific knowledge and technology advance and as practice patterns evolve. This practice advisory reflects the state of knowledge current at the time of publication. Given the inevitable changes in the state of scientific information and technology, periodic review and revision will be completed by the committee.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Quick Reference Guides/Physician Guides

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Iverson RE, Lynch DJ. Practice advisory on liposuction. Plast Reconstr Surg 2004 Apr 15; 113(5):1478-90. [59 references] [PubMed](#)

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004 Apr

GUIDELINE DEVELOPER(S)

American Society of Plastic Surgeons - Medical Specialty Society

SOURCE(S) OF FUNDING

American Society of Plastic Surgeons (ASPS)

GUIDELINE COMMITTEE

American Society of Plastic Surgeons (ASPS) Committee on Patient Safety

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [American Society of Plastic Surgeons Web site](#).

Print copies: Available from the American Society of Plastic Surgeons, 444 East Algonquin Road, Arlington Heights, IL 6005-4664

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Practice advisory on liposuction: executive summary. 4 p.

Electronic copies: Available in Portable Document Format (PDF) from the [American Society of Plastic Surgeons Web site](#).

Print copies: Available from the American Society of Plastic Surgeons, 444 East Algonquin Road, Arlington Heights, IL 6005-4664

PATIENT RESOURCES

None available

NGC STATUS

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